marked activation of plasminogen, with elevation of PAP levels. However this is not associated with activation of hemostasis as detectable by TAT and by elevation of fibrin degradation product as DD, but is associated to elevation of the acute phase protein CRP, suggesting a strong endothelial activation as source of plasminogen production, possibly on an inflammatory basis.

794 Determinants of LV Mass and Wall Motion

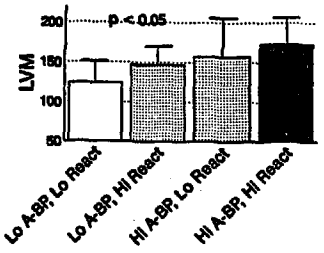
Wednesday, March 27, 1996, 2:00 p.m.–3:30 p.m.
Orange County Convention Center, Room 222

2:00

794-1 Ambulatory Blood Pressure and Stress Reactivity Predict Left Ventricular Mass

Willem J. Kop, John S. Gottdiener, David S. Krantz. *Uniformed Services Univ of the Health Sciences, Bethesda MD; Georgetown Univ Med Ctr, Washington DC*

Left ventricular mass (LVM) is only moderately correlated with 24-hour ambulatory (A) blood pressure (BP). To determine the contribution of BP reactivity to mental stress (MS), cold pressor (CP) and exercise (EX), 47 healthy subjects (mean age 35.7 ± 10.6; 26 women) were studied with math with harassment (MS), and 2 min cold pressor and maximal treadmill EX. LVM on echocardiogram was significantly related to mean A-SBP and A-DBP ($r = 0.43$ and 0.35, respectively; $p < 0.05$) and LVM was higher among males (164.6 ± 34.0 vs. 141.4 ± 37.2; $p < 0.04$). However, these results were attributable to the association ($r = 0.60$; $p < 0.001$) between LVM and weight. LVM correlated with MS induced SBP increase ($r = 0.28$; $p < 0.04$), which remained significant when baseline hemodynamics (SBP, DBP, and HR), age, gender, weight, and height were controlled for using multiple regression analysis.



Patients with A-SBP above the median (> 114 mmHg) and elevated MS SBP reactivity (ΔSBP > 17 mmHg) had the highest LVM. *Conclusion:* Left ventricular mass is increased when both mental stress SBP reactivity and daily life SBP are elevated.

2:15

794-2 Relation of Left Ventricular Contractile Efficiency to Demographic, Metabolic and Anatomic Cardiovascular Risk Factors

Richard B. Devereux, Giovanni de Simone, Thomas G. Pickering, Joseph E. Schwartz, John H. Laragh, Mary J. Roman. *Cornell Medical Center, New York, N.Y.*

Subnormal left ventricular midwall shortening (MWS) in relation to end-systolic LV stress (stress-independent MWS) predicts morbidity and mortality in hypertensive patients with normal LV cavity function. We assessed the relations of LV MW performance to demographic and metabolic variables and to arterial geometry in 303 normals (NL) and 214 hypertensives (HTN) by echocardiography and carotid ultrasound. In multivariate analyses, lower LV MWS and stress-independent MWS in NLS were related to high peripheral resistance, heart rate (both $p < 0.00001$) and cigarette smoking ($p < 0.05$), male gender ($p < 0.00001$), and lower diastolic pressure ($p < 0.0004$) and HDL cholesterol ($p = 0.003$). In HTN, MWS was predicted independently by high resistance ($p < 0.00001$), heart rate ($p < 0.00005$) body mass index ($p < 0.02$) and male gender ($p < 0.0002$) with lesser contributions from age, diastolic pressure and plasma glucose ($p = 0.01$–0.04). In all subjects, low MWS was related to high resistance, heart rate (both $p < 0.00001$) and body mass index ($p = 0.0003$), male gender ($p < 0.00001$) and low age ($p = 0.001$) and diastolic pressure ($p = 0.002$); low stress-independent MWS was predicted by high resistance and heart rate (both $p < 0.00001$), body mass index ($p = 0.0006$), arterial relative wall thickness ($p < 0.005$), cigarette smoking ($p < 0.01$), male gender and lower diastolic pressure (both $p < 0.00001$), age ($p < 0.00005$), arterial expansion in systole ($p = 0.006$) and HDL ($p = 0.02$). Thus, higher LV contractile function is associated in NL and HTN adults with female gender and more favorable systemic hemo-dynamics, arterial structure and function, and metabolic variables.

2:30

794-3 Left Ventricular Hypertrophy During Pregnancy — Do Racial Differences Exist?

Patricia Ray, Arthur Pollak, Steven D. Colan, Suzanne M. Mone, Stephen P. Sanders, Rodney H. Falk. *Boston University School of Medicine, Boston, MA; Boston Children's Hospital, Boston, MA*

Left ventricular hypertrophy (LVH) is commoner in Black hypertensive patients than Caucasians matched for resting BP. This suggests a possible racial difference in the LV response to pressure overload. We postulated that if this were true, then differences may occur between Black and Caucasian patients in the physiologic LVH of pregnancy. We studied 33 Caucasian and 17 Black pregnant women during the first trimester and in the peri-partum period. LV mass was calculated from 2-D guided M-mode echo. For the group, LV mass increased by 17% from 134 ± 28 gm to 157.6 ± 24 gm ($p < 0.01$). There were no differences in LV mass or LV mass index between Black and Caucasian patients in the first trimester or in the peripartum period.

	1st Trimester LVM	Peripartum LVM	% Change
Caucasian (n = 33)	138 ± 32 gm	161 ± 31 gm	16.6
Black (n = 17)	127 ± 21.4 gm	151 ± 14 gm	18.8

$p < 0.01$ for 1st trimester/peripartum comparison p = NS for Caucasian/Black differences.

Conclusion: Black and Caucasian women have similar LVH responses to pregnancy. The difference between these findings and the observed racial differences in the LVH response to hypertension may reflect higher peaks of BP during daily activities in hypertensive Blacks and/or a racially different LVH response between the physiologic volume overload of pregnancy and the pathologic pressure overload of hypertension.

2:45

794-4 Elucidation of Regional Heterogeneity in Myocardial Contractile Function With Tagged Cine MRI

Christine H. Lorenz, Jeffrey M. Bundy, John S. Pastorek. *The Jewish Hospital of St. Louis at Washington University Med. Center, St. Louis, MO; Vanderbilt University Med. Center, Nashville, TN*

To define the physiologic pattern of regional intramural contractile function, 10 healthy volunteers (5 F, 5 M, 21–41 y) were studied with tagged cine MRI to assess systolic deformation (strain). Tagged images were acquired at 6 short axis (SA) levels. $\lambda 1$, the maximum principal strain, (tissue lengthening) was oriented primarily in the radial direction. $\lambda 2$, the minimum principal strain, (shortening) was oriented primarily in the circumferential direction. Strain measurements were performed in 4 cardiac segments (lateral, anterior, septal, and inferior walls) at each SA level (results from 2 of 6 SA levels in table). There was a general trend of decreasing $\lambda 1$ and increasing $\lambda 2$ from base to apex. $\lambda 2$, was significantly different from base to apex only in the septum and inferior wall ($p < 0.05$) $\lambda 1$, was different from base to apex in all 4 regions ($p < 0.05$). Within each SA slice, strain values were relatively uniform (diff. N.S.) across the 4 wall divisions. These data suggest that shortening is more uniform throughout the heart than is lengthening, and that deformation varies more from base to apex than within any SA slice. Therefore, substantial regional heterogeneity of function is present in normal hearts. Its measurement may permit regional assessment of intramural contractile dysfunction.

		Lateral	Anterior	Septal	Inferior
Base	$\lambda 1$	0.23 ± 0.06	0.22 ± 0.05	0.23 ± 0.07	0.27 ± 0.12
	$\lambda 2$	−0.31 ± 0.06	−0.31 ± 0.04	−0.28 ± 0.04	−0.29 ± 0.05
Apex	$\lambda 1$	0.16 ± 0.06	0.14 ± 0.07	0.16 ± 0.07	0.15 ± 0.05
	$\lambda 2$	−0.35 ± 0.04	−0.34 ± 0.04	−0.34 ± 0.06	−0.33 ± 0.06

3:00

794-5 Characterization of Right Ventricular Contractile Motion With Tagged Cine MRI

Stacy S. Klein, Jeffrey M. Bundy, Christine H. Lorenz. *Vanderbilt University Med. Center, Nashville, TN; The Jewish Hospital of St. Louis at Washington University Med. Center, St. Louis, MO*

Right ventricular myocardial motion has previously been studied with implanted radiopaque markers in animals, but little is known about human RV myocardial motion. Tagged cine MRI was used to define RV motion in 9 normal volunteers (22–30 yrs). The RV was imaged at basal, midventricular,